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ABSTRACT

A longitudinal study determined if children's invented spelling served as a viable predictor of reading achievement and compared the predictive value of assessing children's invented spelling relative to other notable predictors, such as letter names, letter sounds, a concept of a word, and phonemic awareness. Subjects, 52 kindergarten children attending an elementary school representing an upper-middle to upper-class socioeconomic stratum, were given a battery of four beginning reading tasks and a measure of spelling ability twice in the kindergarten year. Two years later, the 38 remaining subjects were given the reading comprehension subtest of the Iowa Test of Basic Skills. Results indicated that letter names and letter sounds continue to be impressive predictors of subsequent reading achievement; assessment of early spelling ability was also a viable predictor even after 16 months. Findings suggest that the critical issue in assessing invented spelling appears to be in waiting until children are capable of producing written language that reflects phonetic processing. (Two tables of data are included; 17 references are attached.) (RS)

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Developmental Spelling and Other Language Predictors of Reading Achievement

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Running head: DEVELOPMENTAL SPELLING

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Developmental Spelling and Other Language

Predictors of Reading Achievement

Important predictions about reading achievement have been learned by investigating children's knowledge of written language (e.g., Blatchford, et al., 1987; Kontos, 1988). Researchers have examined many 'parts' of beginning reading to determine what might predict subsequent reading success. Through the years, prereaders' knowledge of letter names, letter sounds, the concept of a word, and phonemic awareness have been suggested to hold significant relationships with reading achievement (e.g., Blum, et al., 1979; Chall, 1967; Ehri, 1983; Goldstein, 1976; Liberman, Shankweiler, Fischer & Carter, 1974).

More recently, investigations of prereaders' early spelling attempts have provided new insights about the importance of the relationship between spelling and reading. Many of these authors report that children's invented spellings provide a good prediction of reading achievement (e.g., Roper/Schneider, 1983). However, few studies have investigated the spelling-reading connection over an extended period of time. Morris and Perney (1984) reported that the developmental spelling attempts of first-graders provide a good prediction for end of the year reading achievement. Using an 18-item spelling test, the authors reported that the test provided substantial correlations with end of the year standardized reading tests (.61 to .74). These findings are impressive. However, relatively short periods of time elapsed between administering the predictor and criterion (i.e., 8 months and 5 months).

If learning to read and spell share common underlying knowledge, than one would expect that a good relationship would also be found when time periods were extended. However, this does not appear to be the case. In a longitudinal study, Kontos (1988) reported that the relationship between invented spelling and reading achievement was only important when the measures were administered concurrently in the spring of first grade. Similarly, Allen, et al. (1989) reported in their study of kindergartners that correlations were highest when the

testing times between reading pretests and spelling posttests were closest to each other.

Therefore, it would seem prudent to determine if children's invented spelling can serve as a viable predictor of reading achievement when longer periods of time are examined. Likewise, research is warranted that compares the predictive value of assessing children's invented spelling relative to other notable predictors of reading achievement, specifically letter names (Blatchford, et al., 1987; Chall, 1967) letter sounds (Masonheimer, et al., 1983), a concept of a word (Blum, et al., 1979) and phonemic awareness (Goldstein, 1976; Liberman, et al., 1974).

Method

Subjects- The study was initiated with 52 children drawn from three intact kindergarten classrooms; thirty-eight remained at the end of the study in second grade. Students attended a single elementary school and represented an upper-middle to upper-class socio-economic stratum in the community. Only children who speak English as their primary language were selected to participate in this study.

Several years ago the children's elementary school adopted a whole language program. Accordingly, the subjects in this study have experienced 30-40 minutes of writing daily since kindergarten. Children have also been encouraged to use invented spelling in their written productions. Mini-lessons on beginning reading skills have also been apart of the school's language program. All classrooms display an abundance of print produced primarily by children (e.g., stories, labels, etc.).

Procedure- A battery of four beginning reading tasks and a measure of spelling ability were individually administered to subjects, twice, during the kindergarten year. In January and again in June, kindergartners were assessed in their knowledge of 1) the names of letters, 2) the sounds of letters, 3) the ability to blend sounds together, 4) the concepts of words, and 5) the sophistication of their spelling attempts. Two years later, in October of second grade, the

reading comprehension subtest of the Iowa Test of Basic Skills (Hieronymus, Lindquist, and Hoover, 1978) was administered.

Knowledge of letter names was measured by asking children to identify the names of all lower case letters when presented individually on 3 x 5 cards (total points=26). Knowledge of letter sounds was measured by asking children to identify the sound of the lower case letters presented individually on 3 x 5 cards (total points=24). Phonemic awareness was measured using a task in which children were asked to blend sounds together (Lewkowicz, 1980). Adams (in press) concluded that there are five levels of phonemic awareness among young children. Phonemic blending was selected because it occupies an intermediate level of difficulty. Therefore, following a demonstration, the kindergartners were shown five CVC nonsense words individually presented on 3 x 5 cards. The subjects were told the sounds of the individual letters and asked to say the word (total points=5).

Knowledge of word concepts was measured by combining five different tasks. The first task asked the child to say a word. The second task asked subjects to circle the words presented in a written sentence. Next, the subjects were shown four sentences. The examiner read each sentence and then asked the subjects to tell how many words were in each sentence. In the fourth task, the examiner read 10 words or short phrases and asked the subjects to tell if there was more than one word. In the last task, the examiner asked the child to give a word for each of the following: a make-believe word, a short word, a long word, and a difficult word (total points=20).

Spelling ability was measured using a modified version of a task developed by Kontos and Mackey (1985). Children were read seven utterances (each a word, phrase or short sentence), and asked to "write down on paper in any way that will help you to remember them". Each of the seven items were scored from zero to eight (total points=56) for sophistication of spelling productions using criteria suggested by Clay (1975). Two teachers trained in evaluating the invented spellings,

independently judged the writing samples and awarded scores with an inner-rater reliability of .76 (January testing) and .80 (June testing).

Reading achievement was measured by acquiring scores from the reading comprehension subtest of the Iowa Test of Basic Skills. A standardized assessment of reading achievement was selected for this study so that a comparison could be made with earlier correlational studies that had investigated spelling and reading achievement. School personnel administered the exam in October of second grade, as part of the school district's regular assessment program. National grade equivalent scores for Form 7 (primary level) were used. The primary battery consists of three sections and, according to the teacher's guide, assesses understanding of factual details and relationships such as cause and effect, traits and feelings, motives, and information leading to conclusions. Some questions assess the ability to understand the main idea and apply information through generalization.

Analysis- Frequencies were conducted on kindergartners' performance for all variables in January and June. T-tests were also conducted to measure kindergartners' performance gains between the two testing sessions. Correlations among all variables were calculated. Specifically, all measures were examined at both testings to investigate how well invented spelling and other selected language variables may predict reading achievement 22 and 16 months later.

Results and Discussion

Table 1 shows the means and standard deviations for the performance of all 52 kindergartners on each of the language variables in January and June. As a group, the kindergartners showed

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Insert Table 1 about here

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significant gains in their knowledge of each of the language variables over the six-month period. That is, gains in language knowledge from January to June were statistically significant at the .01 level for

letter names, letter sounds, a concept of a word, and invented spelling. The gains for blending sounds together were significant at the .05 level. These data indicate that significant improvements occurred during kindergarten for every variable, including invented spelling. This improvement in language growth is consistent with other authors who have investigated kindergartners' language development over time (e.g., Kontos, 1988). Kindergartners were also noted to be particularly advanced in their knowledge of letter names, even by midyear (mean=23.06 for 26 letters).

Table 2 shows correlations were statistically significant ($p < .01$)

Insert Table 2 about here

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between each of the measures administered in kindergarten and the reading achievement scores acquired in second grade. In January, assessing kindergartners' knowledge of letter sounds (r=.76) and letter names (r=.72) provided the best predictions of subsequent reading achievement. Of particular interest was the developmental spelling task which provided a moderate prediction of second grade reading performance (r=.50), accounting for 25% of the variance. However, the assessments in late spring revealed a different picture. In June, letter names (r=.77) and spelling ability (r=.65) produced the highest correlations with reading achievement.

Overall, the data indicate that after a period of 22 months, kindergartners' spelling ability provides only a moderate prediction, while, after 16 months it provides a very substantial prediction of reading. Using a more reliable measure to assess children's invented spelling may have produced stronger correlations. However, more importantly, the predictive quality of the informal spelling task was notably improved when it was administered at the end of kindergarten (from .50 to .65). Indeed, after a period of 16 month, an assessment of children's invented spelling provided a strong prediction of reading success.

Hence, contrary to suggestions of some authors (Allen, et al., 1989; Kontos, 1988) strong correlations are not the result of administering these assessments concurrently, but, instead may demonstrate the importance of assessing children's spelling knowledge at a particular time. The compelling issue appears to be when to measure children's invented spellings to determine later reading achievement.

Findings in the current study would suggest that assessing children's invented spellings for the purpose of predicting reading success must be delayed until children are constructing their own phonetic spellings, where sound-symbol associations are observed. In this study, it wasn't until June, that all except one kindergartner had abandoned the use of random letters for more advanced forms of phonetic spelling. Assessing kindergartners' invented spelling before they are capable of producing these phonetic spellings does little in predicting later reading performance.

This argument would also explain why some researchers have reported impressive correlations (.68 -.86) between spelling and reading among first-graders (Morris & Perney, 1984; Roper/Schneider, 1983). The spelling productions constructed by most first graders' are phonetic and reflect some of the same skills and concepts needed to become a proficient reader. This argument also explains why Kontos (1988) found only a moderate relationship (r=.46) between kindergartners' spring spelling assessment and first grade reading test scores. Kindergartners, for the most part, are not producing spellings that reflect phonetic processing of letter sounds.

Nonetheless, a high correlation was reported in the current study between kindergartners' spring assessment and second grade reading achievement. This is particularly interesting, given that both the Kontos' and current study used almost identical assessments for spelling and similar posttest measures for reading achievement (the Comprehensive Test of Basic Skills and the Iowa Tests of Basic Skills, respectively).

kindergartners in the former study were not producing phonetic spellings even by spring. A second factor may have been the differences in reading instruction. Children in the current study received 30-40 minutes of writing daily with additional instruction in reading-related skills and concepts. Children in the Kontos study were described as receiving no formal reading instruction with only some reading readiness skills being implemented during kindergarten. Further research is needed to determine the effects of these factors on children's productions of invented spellings.

In sum, although letter names and letter sounds continue to be impressive predictors of subsequent reading achievement, assessment of early spelling ability is also a viable predictor, even after a period of 16 months. The critical issue in assessing invented spellings appears to be in waiting until children are capable of producing written language that reflects phonetic processing. Hence, the findings reported here corroborate and extend the investigations by other researchers on the relationship between invented spelling and reading development (e.g., Morris & Perney, 1984).

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Table 1

Means and Standard Deviations for Early Reading Concepts and Spelling Ability Among Kindergartners (N=52)

	January		June		
	M	SD	M	SD	t
Letter names (max=26)	23.06	2.88	24.96	1.20	6.19**
Letter sounds (max=24)	14.54	5.86	18.14	3.77	5.47**
Blending sounds (max=5)	1.35	1.63	1.79	1.58	2.16*
Word concept (max=20)	15.10	3.20	17.14	2.80	5.66**
Spelling ability (max=56)	37.40	9.60	45.00	5.55	7.09**

*p<.05. **p< .01.

Table 2

Correlations Between Second Grade Reading Achievement and Kindergartners' Language Concepts (N=38)

	Reading achievement	
	January	June
Letter names	.72**	.77**
Letter sounds	.76**	.48**
Blending sounds	.51**	.51**
Word concept	.49**	.56**
Invented spelling	.50**	.65**

**p< .01.